Appln. No.: 10/524,965
Amendment Dated January 8, 2007
Reply to Office Action of November 8, 2006

Remarks/Arguments:

Claims 1-21 are pending and stand rejected. By this amendment, claims 1-5, 7, 10-1, 16 and 18-19 are amended.

No new matter is presented by the claim amendments. Support for the claim amendments can be found through out the original specification and, more particularly, in the original specification at paragraph [0023].

Rejection of Claims 1, 2, 7, 10, 13 and 18 under 35 U.S.C. §103(a)

In the Office Action, at item 5, claims 1, 2, 7, 10, 13 and 18 are rejected under 35 U.S.C. §103(a) as being anticipated by Tyan et al. (U.S. Patent No. 5,893,127) (hereafter referred to as Tyan) in view of Ozaki (U.S. Patent No. 5,699,453).

Reconsideration is respectfully requested.

Claim 1

Claim 1 is directed to a method for generating structured document files from a document image, and recites:

> comparing a layout graph of the document image with a layout graph of each model file of a plurality of model files, the layout graph of the document image representing a spatial relationship among the at least three zones in the document image and the layout graph of the respective model file representing an other spatial relationship among schema elements associated with the respective model file; [and]
>
> selecting a model file of a plurality of model files based on the comparison of the layout graph of the document file with the layout graph of each model file, (brackets added).

Claim 1 includes the step of comparing layout graphs (i.e., of the document image with each of the model files) and selecting a model file based on the comparison. The present invention of claim 1 includes an advantage not found in Ozaki, namely; it can handle any type of abstraction in the document information because it is based on graphs (i.e., spatial relationships of the underlying information).

Tyan Reference

In the Office Action, the Examiner acknowledges that "Tyan does not disclose expressly selecting a model file of a plurality of model files, each of the model files representing a respective type of document image..." (See Office Action at page 3.)

It is submitted that Tyan does not disclose the selection of a model file and, furthermore, is silent regarding anything related to comparison of layout graphs or the selection of a model file based on a comparison of such layout graphs.

Ozaki Reference

Ozaki, which the Examiner uses to show model file selection, does not disclose the comparison of layout graphs for selection of a particular model file. Instead, Ozaki discloses the comparison of a spatial relationship between major white regions 460 corresponding to (i.e., between and within) each document element 470 to those in "the **selected structural model**" (See Ozaki at column 6, line 26-30). That is, in the Ozaki apparatus, comparison of spatial relationship is not of a graph representing a spatial relationship among at least three zones in the document image. This is because, as recited in claim 1, at least one zone contains text image (i.e., an is, thus, not a major white region). Further, such a comparison occurs with the selected model file (I.e., **after selection** of a model file and, in particular, **NOT to select the model file)**.

Ozaki further discloses how the selection of the structural model occurs. First, vertical major white regions 460 (i.e., background regions) are identified to determine particular columns of a document image. Then, a space string 502 is generated. The space string 502 (see FIG. 11 of Ozaki) defines a sequence of major white regions for a column of the document image. The space string 502 is a sequence of character codes, each code representing a different vertical height of the horizontal major white regions 460. Each structural model describes the "'physical' column structure," (i.e., a single column structure). (See Ozaki at column 10, lines 19-29.) Each column is further represented by a one dimensional character string 504 (which are logical tags for different document elements, e.g., header information, body text information or figure, etc.). A combination of comparisons of the space and column strings 502 and 504 with those of the structural models results in selection of a particular model. (See Ozaki at column 10, lines 39-58.)

Alternatively, Ozaki discloses that in a multiple column image, each column can be represented by a one dimensional character string 504 and these character strings 504

can then be compared with those of the particular structural models. (See Ozaki at column 10, lines 31-34.)

Ozaki, however, is silent regarding model selection based on comparison of layout graphs (the comparison of spatial relationships among the zones in the document image with the spatial relationships of schema elements in a model file). This is because, the selection of the structural model in Ozaki is a different process (i.e., a matching process based on: (1) space strings, i.e., vertical heights of the major white regions); and (2) column strings, i.e., logical tags).

Accordingly, it is submitted that claim 1 patentably distinguishes over the cited art of Tyan and Ozaki, taken singularly or in any proper combination, for at least the above-mentioned reasons, and is submitted to be allowable.

Claims 10, 13 and 18

Claims 10, 13, and 18, although not identical to claim 1, include patentably distinguishing features similar to those of claim 1 and, accordingly, are submitted to patentably distinguish over Tyan in view of Ozaki for similar reasons to those of claim 1, and are submitted to be allowable.

Claims 2 and 7

Claims 2 and 7, which include all the limitations of claim 1 from which they ultimately depend, are also submitted to patentably distinguish over Tyan in view of Ozaki for at least the same reasons as claim 1, and are submitted to be allowable.

Rejections of Claims 3-6, 11-12, 14-15 and 19-21 under 35 U.S.C. §103(a)

In the Office Action, at item 6, claims 3-6, 11-12, 14-15 and 19-21 are rejected under 35 U.S.C. §103(a) as being obvious over Tyan and Ozaki in view of Yamashita et al. (U.S. Patent No. 5,555,362) (hereafter referred to as Yamashita).

Reconsideration is respectfully requested.

Claims 3-6, 11-12, 14-15, and 19-21, which include all the limitations of claim 1, claim 10, claim 13 or claim 18, are submitted to patentably distinguish over Tyan and Ozaki for at least the same reasons as their respective base claims.

Yamashita Reference

Yamashita does not overcome the deficiencies of Tyan and Ozaki. This is because, Yamashita does not disclose or suggest the selection of a model file from a plurality of model files or the comparison of layout graphs, as required by claim 1. More particularly, Yamashita discloses a layout model 80 which schematically represents the tree structure 61 of the document image 51. In Yamashita, the layout model 80 is automatically generated based on the document image. (See Yamashita at column 5, lines 43-48 and column 5, line 66 to column 6, line 6.) That is, Yamashita teaches away from the selection of a model layout because each model layout is generated automatically. In particular, in Yamashita, each model is not selected from a plurality of existing model layouts. Instead, the document image is analyzed to automatically separate objects of the document and the document image is segmented into tree structure areas. The area segmentation of the tree structure is displayed on the display unit and a user interactively execute corrections to define a desired tree structure. (See Yamashita at column 1, line 62 to column 2, line 2.) Thus, Yamashita does not disclose or suggest anything related to the selection of a model file. Further, Yamashita at FIG. 12, shows a tree structure of a model with schema elements having spatial coordinates. Nothing in Yamashita, however, discloses or suggests a layout graph of the document image or the comparison of such a layout graph to the model tree structure shown for example in FIG. 12 of Yamashita.

The cited art of Tyan, Ozaki and Yamashita, taken separately or in any proper combination, does not disclose or suggest the above-mentioned selection and comparison features, (as recited in claims 1, 10, 13 or 18.)

Accordingly claims 3-6, 11-12, 14-15 and 19-21 are submitted to patentably distinguish over the combination of Tyan, Ozaki and Yamashita for at least the same reasons as claims 1, 10, 13, and 18, and are submitted to be allowable.

Rejection of Claim 8 under 35 U.S.C. §103(a)

In the Office Action, at item 7, claim 8 is rejected under 35 U.S.C. §103(a) as being obvious over Tyan and Ozaki in view of Nasr et al. (U.S. Patent No. 6,263,332) (hereafter referred to as Nasr).

Reconsideration is respectfully requested.

Claim 8, which include all the limitations of claim 1 from which it depends, is submitted to patentably distinguish over Tyan and Ozaki for at least the same reasons as claim 1.

Nasr Reference

Nasr does not overcome the deficiencies of Tyan and Ozaki. This is because, Nasr does not disclose or suggest the selection of a model file from a plurality of model files and therefore that each of the model files represents a respective type of document image or comparison of layout graphs. Nasr, which is used by the Examiner to show that structured document files include XML files and XSL files, discloses a transformative process being used such that a server enables an appropriate XSL specification given the available browser information. That is, selection of the XSL transformation specification is based on the type of browser available. Nasr discloses that a "transformative sequence [i.e., the result of the selected transformative process] ... access[es] a set of XSL transformative rules" to establish a display for the XML information into the necessary format. (Brackets added; see Nasr at column 12, lines 33-40.) Thus, Nasr teaches how to use structured documents for parsing and for interrelating elements within the structured document for compatibility with various browsers. (See Nasr at column 8, line 67 to column 9, line 14 and column 11, lines 16-31.) Nasr is silent, however, regarding use of model files and accordingly, that such files represent respective document types. Nasr is also silent regarding layout graphs of such model files and, is thus, silent regarding a comparison of such a layout graph for selection of a particular model file.

The cited art of Tyan, Ozaki and Nasr, taken separately or in any proper combination, does not disclose or suggest the comparison of layout graphs or the use of such a comparison for selection of a particular model file.

Accordingly, claim 8 is submitted to patentably distinguish over the combination of Tyan, Ozaki and Nasr for at least the same reasons as claim 1, and is submitted to be allowable.

Rejection of Claims 9, 16 and 17 under 35 U.S.C. §103(a)

In the Office Action, at item 8, claims 9, 16 and 17 are rejected under 35 U.S.C. §103(a) as being obvious over Tyan and Ozaki in view of Barrett (U.S. Patent No. 5,442,746).

Reconsideration is respectfully requested.

Claim 16, although not identical to claim 1, includes patentably distinguishing features similar to those of claim 1, and, accordingly, is submitted to patentably distinguish over Tyan and Ozaki for similar reasons to those of claim 1.

Claims 9 and 17, which include all the limitations of claim 1 or claim 16, are submitted to patentably distinguish over Tyan and Ozaki for at least the same reasons as claim 1 or claim 16.

Barrett Reference

Barrett does not overcome the deficiencies of Tyan and Ozaki. This is because, Barrett does not disclose or suggest the selection of a model file of a plurality of model files and, furthermore, that each of the model files represents a respective type of document image. Moreover, Barrett is silent regarding comparison of layout graphs. Barrett, which is used by the Examiner to show that workflow icons are updated to represent particular steps (i.e., segmenting, converting, labeling, and automatically associating mark-up tags), is silent regarding any selection of model files or comparison of layout graphs for such a selection.

The cited art of Tyan, Ozaki and Barrett, taken separately or in any proper combination, does not disclose or suggest at least the above-mentioned selection and comparison features as recited in claim 1 or a similar recitation of:

> a schema panel for displaying a schema corresponding to the document image and a selected model file which is selected from a plurality of model files based on the comparison of the layout graph of the document file with the layout graph of each model file, each of the model files representing a respective type of document image, and wherein the layout graph of the document image representing a spatial relationship among zones in the document image and the layout graph of the respective model file representing an other spatial relationship among schema elements associated with the respective model file,

as recited in claim 16.

Accordingly, claim 16 is submitted to patentably distinguish over Tyan, Ozaki and Barrett for the above-mentioned reasons, and is submitted to be allowable.

Claims 9 and 17, which include all the limitations of claim 1 or claim 16, are submitted to patentably distinguish over Tyan, Ozaki and Barrett for at least the same reasons as claim 1 or claim 16, and are submitted to be allowable.

Conclusion

In view of the claim amendments and remarks set forth above, Applicants respectfully submit that claims 1-21 are in condition for allowance and an early notification to that effect is earnestly solicited.

Respectfully submitted,

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January 8, 2007

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